

Country Club Lawn and Tree Specialists Inc.

CONOPS Manual

Contents

Introduction	3
Mission	3
Definitions	3
Legal Notes	3
Flight Authority	3
Purpose	4
Aerial Vehicles	4
Operations	5
CONOPS	5
Philosophy	5
Expectations	6
Required Knowledge	6
Visual Observers	6
Operations Limits	6
Medical Notes	7
Training	7
Pre-Mission Planning	8
Responsibilities	8
Mission Planning Pitfalls	8
Mission Planner Kit	8
Sample Products	9
Notes on Products	9
Mission Standards	10
Checklist	11
Maintenance	11
Administration	12
Safety	12
Training	13
Appendix	14
Briefing Guides	14
Visual Observer Training	15

Introduction

Mission

To deliver precision crop treatments achieving grower objectives.

Definitions

The submitter of this manual is referred to for brevity as “The Operator”.

The aviation terms, acronyms, and abbreviations used in this manual follow the same definitions used in appendix 3 of the current airman’s information manual or the pilot/controller glossary from the same document.

A current version is available at this link:

https://www.faa.gov/air_traffic/publications/media/aim_basic_8-15-19.pdf

Legal Notes

Operations will be conducted in accordance with applicable federal, state and local law and regulations. The procedures outlined in this manual reflect the current applicable guidance as best available in an area with rapidly evolving directives. This document is an official document for use by all personnel. When it is found to conflict with legal requirements, a mission will be suspended until the issue in question can be resolved. Further this document and the intentions of the operator will endeavor to provide all due privacy protections in respect of one’s civil rights. All activities will be conducted over the property of the client unless otherwise permitted.

Flight Authority

Each flight will be logged and these logs will include all part 137 required data fields, plus all applicable state department of agriculture required data fields.

At this time The Operator will be engaged in aerial mapping or imaging sorties and precision ag spraying missions.

Purpose

This manual is intended to capture the operating methods and philosophy of The Operator. It is written to reinforce the policy of The Operator to operate within the constraints of any FAA issued waivers and all other governing law. To do so in respect of others living in the areas near our operations and with proper respect for personal privacy. To do all of this safely and effectively by utilizing sound aviation risk management and mitigation processes.

This manual is written to address the UAS operations as they exist the day of publishing. Equipment, personnel and environmental risks will evolve over time. Guidelines of this manual will be reviewed annually by The Operator's chief pilot and updated as needed in order to mitigate risks and ensure compliance with applicable guidance.

Aerial Vehicles

The Operator may operate the following UAS:

- Hyllo AG-122
- Hyllo AG-116
- Hyllo AG-110

Operations

CONOPS

The ConOps is to set up a launch and load station at the field access point for the target treatment field. During these sorts of operations, the UAS will climb to the minimum safe entry height and proceed to the start point of the flight plan. In this way the risk of inadvertent application of pesticide to non-target ground will be at a minimum because the vast majority if not entirety of the flight will be conducted over the target field. Selection of the specific location on the field will be contingent on environmental factors including wind, visibility, location of hazards and clear lines of sight for the airspace immediately above the field as well as the avenues of approach as much as practicable. On missions where it is needed to mitigate operational risks, The Operator will conduct a detailed mapping of the target field using aerial imaging. The intent of this is to identify hazards and potential areas where UAS operations at optimal spray altitude might not be possible from the default launch and load locations. If waiver relief is granted for beyond line of sight operations (BLOS) then the mission planner will use the topographical information to identify the launch location providing the best risk mitigation; by considering unobstructed view of the sky above the target operating area. If the operational risk mitigation measures include a VO, the mission planner will identify the best location for a VO to comply with their duties.

Philosophy

The flight lead/PIC will not seek to deconflict from a specific vehicle but rather sanitize the airspace about the entire operation. If a hazard or unbriefed vehicle is observed near the operating area, any member of the team will immediately announce “knock-it-off”. This statement will be repeated by each team member along with their position in this priority order; For example: “pilot knock-it-off”, “VO knock-it-off”, “ground knock-it-off”. The team member identifying the hazard will relay the approximate bearing (using 8 cardinal directions), range, and altitude estimate along with pointing in the direction of the conflict. In an emergency situation any team member who first identifies the severity of the risk can recommend risk mitigating action (examples might include; recall all vehicles, freeze position, or emergency land in place). The key is for the team member to be first directive then descriptive. For example; “all vehicles hold position, unbriefed aircraft transiting 1 mile north of the operations area east to west below 500 ft (while pointing in the direction of the conflict). If the pilot/flight lead is not the first to identify the risk they will immediately suspend ops by directing all flight vehicles to hover in place at current altitude while they request hazard location and details. If wildlife, a farm vehicle or unbriefed person is observed within 100 feet of the target operation zone the team member identifying the hazard will immediately announce “terminate”. The acknowledgement will continue in the same manner as airborne hazards through risk identification, assessment and mitigating action.

Expectations

All pilots will be trained in accordance with the latest manufacturer drone manuals and any Operator supplements.

All Pilots will be licensed to operate UAS's per far part 107 and any conditions of FAA approved waivers for operations. All pilots will have a valid and current FAA Class 2 Medical.

Required Knowledge

All pilots will understand and/or follow:

1. Applicable regulations relating to UAS rating privileges, limitations, and flight operation;
2. Airspace classification and operating requirements, and flight restrictions affecting UAS operation;
3. Aviation weather sources and effects of weather on UAS performance;
4. UAS loading and performance;
5. Operation and Safety Manual emergency procedures;
6. Radio communication procedures;
7. Determining the performance of UAS;
8. Physiological effects of drugs and alcohol;
9. Aeronautical decision-making (ADM) and judgment;
10. Airport operations;
11. Maintenance and preflight inspection procedures.

Visual Observers

Visual observers will be trained in accordance with the Manufacturer manuals and any Operator supplements.

Operations Limits

- VLOS will be the primary method for operations even if a BVLOS waiver is approved. in the absence of a BVLOS waiver or if the mission scenario cannot meet any conditions of a BVLOS waiver then all operations will be VLOS.
- The UAS will not be operated over any persons not directly participating in the operation unless they are inside a building or vehicle.
- Unless a 107 waiver is approved by the FAA, The Operator will constrain all operations to daylight and with an anti-collision light the period of civil twilight (30 minutes before official sunrise to 30 minutes after official sunset).
- Max ground speed 30 mph (unless within the 500ft distance later specified)
- Max altitude 200 ft AGL (unless within the 500ft distance later specified)
- Max vehicle distance from ground station 5000 ft.
- Weather minimums at the control station location determined to the best of the PIC's ability and informed by the nearest FAA official observations of at least 3 statute miles visibility and the appropriate cloud clearances for the airspace the mission will occur within.
- No hazardous material other than authorized by part 137 certificate.
- No operations of a UAS in a careless or reckless manner so as to endanger the life or property of another; or allow an object to be dropped from an unmanned aircraft in a manner that creates an undue hazard to persons or property.
- All conditions and limitations prescribed by the 44807 waiver will be followed.

Medical Notes

- No member of the team may participate in the mission if they are not well rested and emotionally able to focus on the task at hand.
- As part of the safety culture and concern for team members long term health they are expected to communicate with leadership if they are not fully capable of meeting their responsibilities. This will result in an assessment of mitigation options and any changes to the crew or schedule.
- The UAS supervisor will brief all crew members during training and refresh as necessary concerning being medically mission ready. This topic will include the topics of over-the-counter medication, emotional, physiological, stress, distractions and exhaustion in addition to treatment by a medical professional. None of these instructions should be taken to be a request or authorization to violate HIPA protections. Team members will be reminded that FAA credentialed individuals are subject to the FAA policies concerning 14 CFR § 91.17.
- This includes the prohibition for operators and observers of consuming alcohol within eight hours of a mission or having a bac of 0.04 or greater.
- All employees will be subject to random testing to ensure compliance.
- For those members operating under the privileges of a class 2 medical they will ensure that they follow applicable guidance.

Training

- The training program for operators and observers will be based on the latest manufacturer manuals and Operator Training Manual.
- All team members will be trained for the positions they are assigned.
- Ground support members will be trained to handle the pesticide materials as directed by applicable state department of agriculture regulations.
- Ground support members will also be trained to load the Hylion AG-122, AG-116, or Hylion AG-110 and change batteries
- Ground support members will be trained to identify potential traffic conflicts using both electronic and visual methods to include binoculars if they are not operating as a member of the PIC and VO team.
- This ground support training will include how to 'terminate', 'suspend' and 'knock-it-off' as per the CONOPS discussion.
- Visual observers (VO) will be trained in accordance with FAA instructions concerning VO responsibilities. this will include communication techniques and will include how to 'terminate', 'suspend' and 'knock-it-off' as per the ConOps discussion.
- The chief pilot will have an FAA UAS pilot license.
- The chief pilot will be responsible for ensuring that Operator training programs meet all FAA requirements, all manufacture requirements and crew position specific training requirements.
- New pilots will not be assigned to missions where they act as the PIC until they are credentialed as a FAA UAS pilot and complete the operator training outlined in the Operator Training Manual.
- All training records will be retained as part of the official Operator records.
- All required knowledge listed in the previous discussion will be conveyed between training based on the Operator Training Manual as well as the PIC part 107 pilot certification.

Pre-Mission Planning

Responsibilities

- Pre-mission planning will include review of google maps to confirm the client's description of the property layout
- Additionally, the planner will review the airspace type above the job site to determine if any additional approvals are needed.
- Determine if any TFRs affect or might affect the mission on the intended day of the sortie.
- Ensure an appropriate notam, if required, is issued per any FAA waivers.
- If the target treatment area has not been mapped, arrange to map the field sufficiently prior to the mission to ensure obstacles can be identified and flagged appropriately for the mission planning software. This can also help predict if the operation might involve BVLOS rules.

Mission Planning Pitfalls

Pre-mission oversights have been the most common cause of mishaps with a Hylio AgroDrone.

- Oversights include unflagged obstacles.
- Flying too close to high Voltage transmission lines.
- Uneven terrain due to waterways or lanes in the middle of a field.
- The planners will conduct an interview with the grower and if necessary (due to lack of grower familiarity with the field), also interview the land owner or if the landlord is not local a neighbor familiar with the field.
- In addition to questions about obstacles the interview should ask about sensitive areas and habitat to be avoided with pesticides, such as any bee activity.

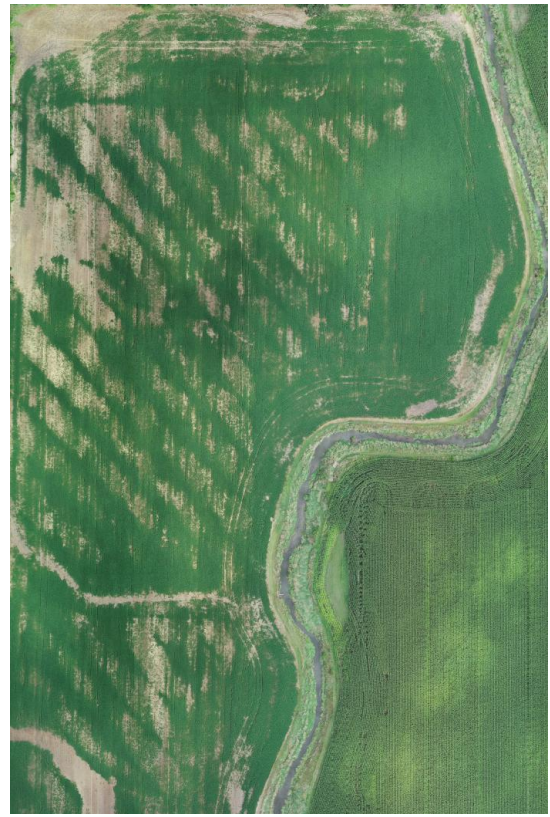
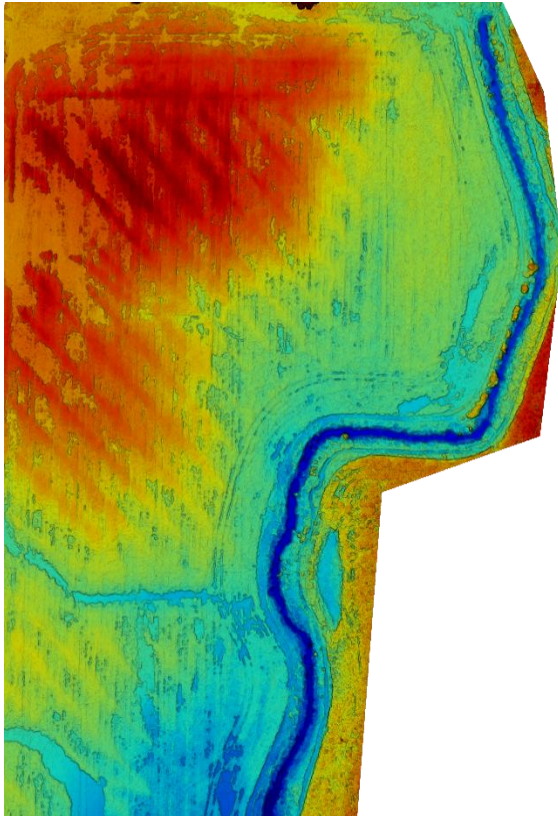
Mission Planner Kit

Mission planners will also ensure the on-site operations kit has the required items:

- Cell phone to provide hot spot.
- Web capable device for accessing flightaware, flight radar 24 or ads-b exchange type websites for real time air picture of nearby aircraft
- UAS with toolkit (for assembly and calibration).
- Anemometer for precision wind data.
- Selection of nozzles to ensure the desired application droplet size.
- The battery charging system with charged UAS batteries.
- GPS tracker.
- AgroSol laptop with aux power (generator and fuel).
- Continue with preparations as outlined in Operator Manuals.
- Emphasize to PIC that the preflight is both an airworthiness validation & prep for flight.

Sample Products

This is a sample of products available for pre-mission analysis:



Notes on Products

The image uses colors to depict the elevation of the field. The longer wavelength colors depict the higher elevation, while the shorter wavelength colors depict lower elevation. This elevation range depicted covers 20 feet from the reds to the violet. If the operating location selected based on field access and prevailing winds happens to be on the south edge of the field this model would alert the planner to the potential for UAS operations in the northeastern part of the field to be potentially obscured by foliage along the creek even though the total distance from southern to northern edge of the field is only 3811 feet. However, the western part of the north end of the field should be within VLOS because it is depicted in red unless the crop canopy is more than 4 feet above the surface. The second image depicts an RGB image of the field.

Mission Standards (100ft - 500ft from nonparticipant)

Standard mission operations in addition to the specifications of the Operation and Safety Manual are listed below. These additional standards must be followed when flying within 500ft (but no less than 100ft) of nonparticipating vessels, vehicles, and structures.

- 1) Use the AgroSol software to plan the mission including establishing a 100ft geofence boundary no closer than 100 feet from applicable waterways, roadways, or structures.
- 2) The edges of the field will be flight planned in a manner so as to not alarm or endanger non-participating people or property.
- 3) When the mission will come within 500 ft of a structure, waterway, or road with an average traffic load of greater than 10 vehicles per hour (PIC will determine) then the flight plan will ensure the UAS operate in a parallel manner (swaths will be parallel, maneuvers at the end of a swath may briefly move the UAS toward or away from the structure, road, or waterway) to the structure, road, or waterway.
- 4) If a nearby structure contains people the PIC must be prepared to suspend operations if any unbriefed personnel emerge from a sheltered location within 100ft of an active spraying operation.
- 5) If the nearby road experiences traffic, operations may continue within 500 ft and up to 100ft as long as paths of the drone are largely parallel. If in the PICs judgement the potential for drift-able fines due to prevailing winds presents a risk to traffic on the road then the mission will be suspended.
- 6) The PIC must have a minimum of 7 hours experience operating the specific make and model UAS authorized under this exemption, at least 3 hours of which must be acquired within the preceding 12 calendar months.
- 7) The PIC must have a minimum of 25 hours experience as a PIC in dispensing agricultural materials or chemicals from a UA.
- 8) The UA may not be operated at a groundspeed exceeding 15 miles per hour.
- 9) The UA altitude may not exceed 20 feet AGL
- 10) The PIC must make a safety assessment of the risk of operating closer than 500 feet from those objects and determine that it does not present an undue hazard. This safety assessment is outlined in the Risk Assessment & Mitigation Manual on page 12.

Checklist

Appropriate checklists will be used as produced by the manufacturer. Upon arrival at the site the operator will conduct a briefing that covers at a minimum the following topics:

- Weather (specific operational impacts for drift and hazard areas).
- Ground hazards (manmade and natural, along with nonparticipating people).
- Air hazards (visibility, NOTAMs, location of nearest airfields and military training routes) and operator status if aware of any activity.
- Brief team members on their duties during ground operations and any changes to those duties during flight operations.
- The operator and VO duties, communications and proximity will follow the FAA UAS rules in part 107. At the discretion of the operator the ground crew and other team members should be deployed around the treatment area in a manner that enhances operator situation awareness to mitigate safety hazards.
- Safety emphasis

Prior to the sortie a pre-takeoff brief will update any topics previously briefed upon site arrival plus the following topics:

- Any airspace situational awareness (ads-b, flightradar-24)
- Go, no-go roll call for ground team, visual observer.

Maintenance

- All Operator vehicles will follow the Manufacturer maintenance schedule, process and documentation.
- Scheduled maintenance will occur as much as possible at times when no missions are planned. If a vehicle will be unavailable for a scheduled mission then it will be rescheduled.
- Unscheduled maintenance either prior to or after a mission will be conducted in accordance with the same guidance as scheduled maintenance. If the discrepancy is not addressed in the guidance then for minor issues the PIC can take appropriate action and then document it. If the discrepancy prevents the aircraft from being airworthy then The Operator will contact the manufacturer to seek instructions for how to return the vehicle to service.
- Operator personnel will perform all maintenance unless approved by the owner/operator.
- The inspection criteria, frequency, checklists, and procedures are contained in the Manufacturer maintenance manual.
- Troubleshooting instructions and error codes are contained in the Manufacturer software and training manual. This document also contains instructions about access to the vehicle logs for expanded troubleshooting either with or without support from the Manufacturer.

Administration

All equipment will be secured at the end of any mission. All facilities will be kept in an organized and clean state.

All missions will be scheduled on a first come-first served basis with exceptions at the discretion of the UAS supervisor.

If any team member is contacted by someone other than the client for their currently assigned mission, then they will request that the individual contact the UAS supervisor for any additional questions.

Safety

A vibrant safety culture with an effective mishap prevention program is essential to the health of the organization. All team members will be regularly reminded of their vital role in achieving this element of the mission. Safety audits, inspections, practices and process reviews are being conducted with the full support of the owner/operator. Safety messages will be distributed via bulletin, or MSDS.

FAA safety programs such as FAAST and WINGS are excellent resources to strengthen a healthy safety organizational culture and educate the team members.

Initial training and orientation will include a thorough indoctrination to the aviation safety mishap prevention culture.

Training

Sample crew member responsibilities:

PIC

- Final authority over the mission once the crew is at the parcel of land to be treated.
- Ensure operations comply with all FARs and any conditions of FAA waivers plus any other applicable guidance.
- Focus on operating the UAS to achieve the mission.
- Exercise effective crew resource management techniques to keep the crew focused on the mission, this might include suspending operations for urgent clarification or feedback.
- In the absence of other crew members the PIC will accomplish any of the other post mission duties.

Visual Observer (VO)

- Look and listen to identify potential conflicts.
- VOs can utilize information from the electronic situational awareness aids but they will not alter or lose focus on their main role in looking and listening for conflicts. For example, if ads-b indicates a low altitude contact converging on the operation location from the west the VO can use the information to focus additional time looking to the west to visually acquire the conflict.
- VOs should also be looking for potential conflicts with things on the ground such as vehicles, people or animals.
- After the mission, VOs will be responsible for completing the logs.

Ground Crew

- Assist with launch and recovery site setup.
- Ensure the proper mix of product for the treatment of the field.
- Assist the PIC in assembly, setup, calibration and any other tasks.
- Assist with the electronic situational awareness items.
- Be prepared to facilitate vehicle servicing when they are on the ground to minimize ground time.

Required Equipment:

- Crew members will wear all specified pesticide protective equipment per the label (during mixing, or filling).
- Crew members will have available eye protection and use it at any point it is required by FAA, or manufacture or The Operator's guidance.

Appendix

Briefing Guides – Appendix A

Pre-Mission:

- Weather
- NOTAMs
- ADS-B
- Flight Tracker
- Signal devices
- Landmarks
- Team member briefs (Flight lead, VO, ground)

Emergency:

- Freeze
- Cut motor
- Return to home
- Mishap
- Spill
- Traffic conflict
- Unbriefed vehicle
- Unbriefed pedestrian
- Directive then descriptive avoidance
- Terminate drill
- Knock-it-off drill

Debrief:

- Mission objectives
- Anomalies
- Did guidance apply
- Was guidance applied
- Did guidance resolve the issue
- Is the anomaly reportable
- Collect required reporting data and recover UAS logs
- Recommend guidance changes
- Lessons learned
- Logs completed
- All items accounted for

Visual Observer Training

Visual observer training (dronepilotgroundschool.com/visual_observer)

What situations call for a VO?

- restricted airspace
- general VO responsibilities
- scanner VO responsibilities
- drone VO responsibilities
- how to scan the sky
- vo positioning
- pre-flight procedures
- communicating during a flight

What situations call for a VO?

A VO is a useful part of any drone mission, but at a minimum we recommend that a VO be used in the following situations:

- there ground objects present hazards
- where varied terrain or other factors may make it difficult for the PIC to maintain a direct line of sight
- for any flight in restricted airspace

The faa provides guidelines on situations where a VO is mandatory:

You must keep your drone within sight. alternatively, if you use first person view or similar technology, you must have a visual observer always keep your aircraft within unaided sight (for example, no binoculars). However, even if you use a visual observer, you must still keep your unmanned aircraft close enough to be able to see it if something unexpected happens. Neither you nor a visual observer can be responsible for more than one unmanned aircraft operation at a time. – faa.gov

Restricted airspace

Regarding restricted airspace, for missions being flown with special airspace authorization we recommend that, wherever possible, two visual observers assist the PIC. For restricted airspace missions, the two types of VOs we recommend having in place are 1) a scanner VO, and 2) a drone VO. The scanner VO's role is to scan the skies and ground constantly, ensuring that the flight path and surrounding area is free of potential obstacles. The drone VO's role is to maintain a visual line of sight with the sUAS at all times. The drone VO should always be ready to share the location of the drone with the PIC in case he or she ever loses the line of sight.

General VO responsibilities

Simply put, the VO helps the PIC by communicating crucial information needed to ensure the safe operation of the drone.

Here is a list of general responsibilities for a visual observer:

- VOs should know about the scenarios that can impact flying conditions, including weather conditions, ground hazards, and airborne hazards.
- VOs should be aware of the faa's small unmanned aircraft (or part 107) regulations regarding flights over people and other prohibited activities, and support the PIC in flying within the

bounds of what is legally permissible.

- VOs not only need to be able to identify issues in the sky, but direct the PIC to take the action necessary to avoid those issues.
- VOs should constantly scan the skies and the ground to identify potential hazards, and notify the PIC of those hazards as they arise.

It's crucial for the PIC to trust the VO's judgment, and immediately act on the VO's advice without question. For this to happen the PIC must trust the VO, and the VO must honor that trust by providing accurate, timely information.

Scanner VO responsibilities

For flights in restricted airspace, we recommend using a scanner VO and a drone VO. The responsibility of the scanner VO is to continually scan the skies, looking for any potential safety hazards. The scanner VO is also responsible for observing the ground and identifying anything there that could be of concern for the mission. If the scanner VO sees people approach during an ongoing mission, it is his or her job to let them know that a drone is being flown nearby, and to ask them to clear the area.

Drone VO responsibilities

The responsibility of the drone VO is to maintain visual contact with the drone being flown at all times. The general VO responsibilities section above provides more information, excluding the final bullet point about scanning the skies and ground (which will be the job of the scanner VO).

How to scan the sky

It's important to have a procedure in place for how you're going to scan the sky so that the VO isn't simply looking all around, but is actually monitoring the airspace in a systematic manner.

Here is the process we recommend for scanning the skies:

- begin your scan by looking at the 12 o'clock position, high in the sky.
- scan from left to right, from the 9 o'clock to the 3 o'clock positions on the clock, making sure to cover the same points / airspace the PIC is currently flying in.
- then, starting at the 3 o'clock position, look down and scan back to the left 9 o'clock position.
- if necessary, look farther downward and scan back to the 3 o'clock position.
- rotate 180 degrees to scan the 3 to 9 o'clock position, covering 3 to 9 o'clock positions that are directly behind the PIC, using the same high/medium/low sky sections.
- start over and repeat.

Of course, the VO also needs to use common sense, and all of his or her senses. If a noise alerts the VO to a potential hazard on the ground or in the air nearby, the cause of the noise should be identified and possible safety issues should be assessed immediately.

VO positioning

The VO should be close to the PIC, but not physically crowding him or her. The rule of thumb here is that the PIC and VO should be close enough that they can hear each other clearly, but not so close that there is a danger they might bump into each other. The VO should also be at a close enough distance to the PIC to ensure that no one else bumps into the PIC. When flying in restricted airspace with two VOs, we recommend the scanner VO stand on the right hand side of the PIC, at the 3 o'clock position, and the drone VO stand on the left hand side of the PIC, at the 9 o'clock position. (this positioning is arbitrary—the two VOs can switch sides if that makes more sense for the mission you're flying; what's important is that each VO have a specific side.)

Pro Tip: The VO should keep in mind that, regardless of his or her position, the information relayed to the PIC should correspond with the PIC's position, not the VO's.

Pre-flight procedures

Before flying, the PIC should communicate with the VO and anyone else involved in the mission regarding:

- operating conditions (includes things like weather, tree cover, or uneven terrain)
- emergency procedures
- contingency procedures
- roles and responsibilities
- potential hazards

The objectives of the flight, anticipated flight paths, and any unique potential hazards or safety issues unique to the locale of the flight should be covered by the PIC. If there are any bystanders, they should be instructed on where they can safely observe the flight. Weather should be checked, and the PIC should communicate with the VO and discuss any conditions that might affect the flight. The PIC should go over the anticipated flight parameters and advise the VO of his or her responsibilities and communicate any special conditions or issues pertinent to the flight, as well as any special needs he or she might have for the specific flight. Emergency procedures should be discussed and possible alternate landing locations identified. Before any flight, all parties should agree that there are no outstanding issues and the flight is ready to proceed.

Communicating during a flight

In general, during a mission the PIC will be flying and the VO will be performing the duties laid out in the sections above that pertain to VO responsibilities.

Here are some useful phrases to use when communicating during a flight:

VO phrases:

- “approaching distance limit”—to be used when the VO is in danger of losing his or her line of sight with the drone.
- “distance is a go”—to be used when the PIC has moved the drone back into a range where the VO can comfortably observe it.
- “cannot locate”—to be used when the VO loses site / cannot locate the drone (the latter in response to the PIC's command “locate drone”).
- “bring it down!”—to be used when the VO determines there is imminent danger and the drone needs to be grounded immediately.
- “climb, climb, climb!”—to be used when the PIC needs to climb immediately to avoid an imminent collision.

PIC phrases:

- “preparing to launch”—to be used when the PIC is preparing to launch.
- “launching”—to be used when the PIC is launching.
- “descending”—to be used when the PIC is descending for a landing.
- “landing at new position”—to be used when the PIC is manually flying to a position that is not the original home position.
- “locate drone”—to be used when PIC loses visual contact with the drone.

if either the VO or the PIC cannot locate the drone visually for a period longer than approximately 15 seconds, the PIC should initiate the failsafe return to home function of the drone and alert all observers that he or she has done so.

Communicating location and movement

Clock coordinates should be used for locating hazards:

- 12 o'clock is straight in front of the PIC.
- 6 o'clock is immediately behind the PIC.
- 3 o'clock is 90 degrees to the PIC right.
- 9 o'clock is 90 degrees to the PIC left.

Use the locational words "high" and "low" to indicate the distance to or from the horizon. It's also important to note both the direction and speed with which the hazard is moving by saying "moving away slowly" or "moving closer rapidly", etc. The descriptors are very important here, because they help convey the urgency of the hazard. An object moving slowly away is much less of a concern than something moving rapidly closer. Here's an example of communicating the location of a potential hazard in the sky:

"drone, 12 o'clock high, moving closer slowly"